NEW ARTICLE ON WIKIPEDIA
ULTRA HIGH PRESSURE HOMOGENIZATION (UHPH)

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Introduction

Why UHPH? New technologies looking for advances in food treatments. UHPH makes products with commercial sterility and physical stability

Reason why creating a new article on Wikipedia about UHPH: provide an easy and fast information to companies and students, about this new technology

History

UHPH was created by Ypsicon few years ago, and has exclusive use of this technology until 2032, internationally. The system is under patent by UAB in most important countries, such as United States, Australia, China, Japan, South Korea, India and European Union

Effects caused by UHPH

Particle size reduction to 100-300nm: higher stability and shelf-life of food, creation of nanoemulsions. Fat globule breakage with more interactions due to whey proteins adsorption on its membrane

Total or partial inactivation of most enzymes, such as lipoproteinlipase (LPL), plasmin, lactoperoxidase (LP) or alkaline phosphatase (G. G. Amador-Espejo et al., 2014)

Similar sterility characteristics than UHT or pasteurization, depending on applied parameters, and causing any thermal damage on product, which preserves organoleptic and nutritional properties of the original product. Bacteria and spore inactivation can be total with treatments under 300 MPa at T_i=85ºC (G. G. Amador-Espejo et al., 2014)

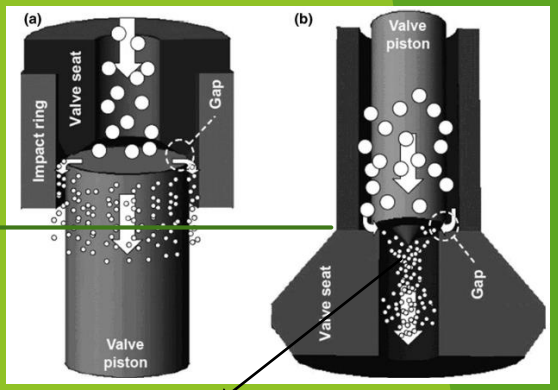
Applications

White cheese with less syneresis, wine production without sulphites, treatment of many products: carbonated drinks, beer, fruit juices and beverages, maturated cheese, sauces, supplemented food, drugs and cosmetics

How does it works?

Fluid flows in continuous through the valve piston to its gap and output, under 300-400 MPa

Figure 1. Valve structure on UHPH equipment (A. Zamora and B. Guamis, 2015)



Mechanical phenomena

Cavitation, shear stress, turbulence, and impacts

Valve geometry is essential for effects produced on food, and its material must be resistant to the heavy conditions during processing (J. Floury et al., 2004a)

A short but intense thermal shock is done at valve's output, that can be for less than 0,02s and the temperature can reach 140ºC. Even so, this is not a limiting factor on the bacteria inactivation (G. G. Amador-Espejo et al., 2014)

Advantages

Meet consumer's expectations, reducing the list of additives and increasing their shelf life in market. Reduction of equipment and maintenance costs, with great versatility on treatments to be applied, according to the parameters. Total or partial inactivation of enzymes, beneficial to each type of product

Conclusions

Research trends: increase the range of products to apply UHPH effectively, due to equipment and material complexity

UHPH as an alternative, since we obtain a safe product with similar nutritional content than raw products, without significant changes. Focused on new industries, production lines or plant renovation, so the Wikipedia article promotes knowledge towards companies and students in the field.

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